ABSTRACT

An object of the present invention is to provide a beam source capable of efficiently generating a high-density energy beam having good directivity and a relatively large beam diameter. The beam source of the present invention comprises a discharge tube; a gas inlet for introducing gas into the discharge tube; three electrodes mounted in the discharge tube downstream from the gas inlet, wherein the electrode on the upstream end has a plurality of openings through which the gas can pass, the middle electrode is a mesh-shaped electrode, and the electrode on the downstream end is a beam-emitting electrode having a plurality of beam-emitting holes and is disposed in a plane parallel to the middle electrode; plasma-generating means disposed between the two upstream electrodes on the outside of the discharge tube for transforming gas introduced into the discharge tube into plasma; and voltage-applying means for accelerating the beam between the two downstream electrodes and emitting the accelerated beam from the downstream beam-emitting electrode.